

Wonders of Radiotelephony

By LORENZO W. MARTIN.

WASHINGTON, April 25.—President Wilson, during his return voyage from France, will be able to talk directly with officials here by means of wireless telephony. It was announced today at the navy department that the president's ship, the USS George Washington, at the time it is expected that he will be able to communicate with the white house or officials in Washington and to receive verbal information from them.

This will be the first attempt at a double telephone conversation across the Atlantic ocean and will be made possible by a powerful radio telephone set installed on the battleship. The ship while it was in the harbor at New York. Secretary Daniels, a few weeks ago, talked by radio telephony to President Wilson while he was en route from France to this country. This however, was a "one-way" conversation, whereas the attempt to be made on the President's trip will be "both ways." When the secretary of the navy talked to President Wilson the George Washington was probably about 800 miles from the coast of the United States, or more than two-thirds of the way from France.

History of Radio Experiments.—The following interesting account of the navy department's experience with radio telephony was made public here today.

Transatlantic radio telephony is not a new thing. Several years ago experiments were conducted by the navy department in conjunction with engineers of the American telegraph and telephone company, the results of which experiments the human voice was transmitted over distances greater than those concerned in the recent tests. The first of these experiments took place on August 27, 1915, when a message was transmitted from the naval radio station at Arlington to the naval radio station at Darien, on the isthmus of Panama. Two selections were played on a phonograph placed in front of the telephone transmitter, and these were correctly recognized by the operator at Darien. In addition, words and sentences were spoken into the transmitter by various officials present, and several words and phrases were received. The distance covered was about 2,100 miles.

On September 29, 1915, a test was carried out between the naval radio station at Arlington, Va., and Mare Island, Cal. The long distance line from New York was connected to the radio telephone transmitter, and a telephone line from San Francisco to

could be transmitted much more economically and efficiently by radio telephony than by radio telephony.

A great many advances in the art have been made since that time. At the urgent solicitation of the navy department, the engineers of the General Electric company, the largest electrical concern in the United States, have become interested in the matter and have developed apparatus which is entirely different from the original outfit. Instead of utilizing oscillations generated by vacuum tubes, the oscillations are produced by the Alexanderson high frequency alternator installed at the New Brunswick radio station, which station has been operated by the navy department since we entered the war.

This machine, the invention of Dr. Ernest F. W. Alexanderson, an engineer of the General Electric company, may be used not only for radio telephony, but also without alteration for radio telegraph, and while the initial cost is considerable, the upkeep is comparatively negligible. The machine is very stable and dependable in every respect, and can be produced in any size desired. The resemblance between the Alexanderson machine and the original apparatus installed at Arlington is somewhat similar to the resemblance between a dry battery and a dynamo. The bulbs, like batteries, are expensive and do not last very long, whereas the Alexanderson alternator may be used for years without deterioration. It must not be imagined, however, that the vacuum tube has been discarded, as a limited number of these are necessary to regulate or "modulate" as the engineers say, the oscillations produced by the alternator, and to superimpose the telegraphic signals upon the continuous wave emitted by the machine. The principle upon which the machine operates is exceedingly simple. A large metal wheel, the rim of which consists of alternate sections of magnetic and non-magnetic material, rotates at a high speed in a magnetic field, and produces oscillations in the coils in the magnetic field. The frequency of the oscillations being proportional to the speed at which the machine is run. Elaborate

attachments are provided to keep the speed of the machine absolutely constant. One of the great advantages of the machine when used for radio telephony is that the wave length transmitted when used for radio telephony is that the wave length transmitted may be varied simply by changing the speed of the machine.

Ready for Conversation.—When the secretary of the navy talked to the president on February 22, he was seated at his desk in Washington and spoke into the transmitter of his ordinary desk telephone which was connected through long distance lines to the radio telephone transmitter at New Brunswick. At that time the George Washington was not equipped with a radio telephone of sufficient power for the president to reply to the secretary, as the ship was then nearly a thousand miles from the coast. It was necessary, therefore, to reply by wireless telegraph.

With the co-operation of the navy department, the General Electric company installed the high power radio telephony aboard the George Washington and every effort was made to have the installation complete in every respect. The previous tests have been simply experiments consisting of transmitting words, figures, photographic selections and various other disconnected matter. But in the present installation the department believes that there has been provided an absolutely dependable and practical telephonic communication for the president at any time, just as though he were seated at his desk in the white house.

The interest that the navy department is displaying in these tests is based upon the fact that efficient and rapid communication with ships at sea is a problem of immense military significance. The advent of radio telephony and telephony has brought about changes in naval strategy comparable to those due to the introduction of armor plate. The navy department has always associated with itself the foremost electrical engineers of the country, and has endeavored in every manner to encourage any advances in the art. Competition is encouraged, and the fact that the navy is the largest pur-

chaser of radio apparatus in the country provides a tremendous stimulus for manufacturing concerns whose developments may prove worthy of adoption. It is solely with a view to the advancement of the art of radio telephony that the navy department advocated the recent bill for the government ownership of radio telephony.

Telegraph Yet Cheaper.—The kinds of radio telephony and radio telephony are separate and distinct, and it is not felt that the improvements in radio telephony will encroach upon the territory of radio telegraph. The relation is very much the same as the ordinary telegraph bears to the telephone. For instance, it is usually cheaper and much more accurate to send a message to a distant point by telegraph than by telephone and it is very much easier to preserve the secrecy of the communication, as a telegram can be sent in code. It is a well known fact that it is exceedingly difficult to transmit a code message by telephone, as certain letters and words are practically indistinguishable. This has long been realized in the navy where a list of names has been prepared for the various letters and they are always used in transmitting code messages or signals by voice.

One of the great advantages of the telephone is that, when accuracy is not of special importance, a message may be transmitted with a great deal more speed by telephone than by telegraph, as the words need not be spelled out. Furthermore, a skilled operator is not required, and there is a personal element in the conversation when one man can talk direct to another which is entirely lacking when the messages have to be transmitted through the medium of an operator. The latter reasons, in a great many respects, carry over into a conversation in a foreign language through an interpreter.

Tested by Airplane.—The radio telephone is especially well adapted to directing the movements of airplanes by a squadron commander, as the vocabulary to be used is limited, and there is little chance of mistaking the words. In this connection the navy has recently

scored another triumph, when the secretary of the navy carried on a conversation with an officer in an airplane which was 150 miles distant. The airplane was equipped with a transmitter so that a two-way conversation was possible. This was a great many miles further than the previous record. The tests about which a great many notices appeared in the press several months ago took place over a distance of only a few miles. It is not felt that a limit for radio telephone conversations in airplanes has yet been reached, as experiments are being conducted which will probably enable the range to be increased. It is interesting to note that on some occasions it is desired to keep the range as small as possible. Certain allied aviation authorities were greatly alarmed when they learned the range of the radio equipment on American airplanes.

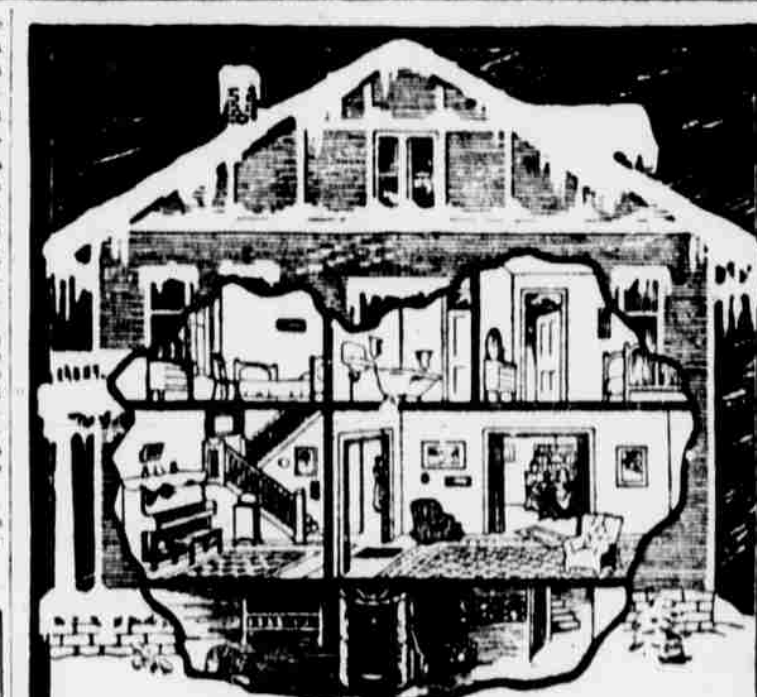
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"About 25 years ago Mrs. Taylor's health began to break down," he continued, "and the first manifestations were impaired digestion and headaches. Even the lightest kind of breakfast foods, such as toast and milk disagreed with her, and she received very little nourishment from what little she did eat, and became very weak. At nights her rest was badly disturbed because of nervousness, and many a night she would not get more than an hour's sleep. She had nervous rigors also, and I have seen her tremble when she had one of these attacks, just as if she had a chill. During any excitement she would become cold and clammy, and her vitality would get so low that she would almost faint away. Sometimes for a week at a time she would be unable to get around the house. I did everything within my power to help her, and consulted some of the best specialists in the state of Illinois, but without meeting with any success. She kept on getting worse until I had about arrived at the conclusion that there was no hope for her. Then I heard so much about Tanlac helping people that I decided to get her a bottle, even if I didn't think it would do her much good. Before she had finished the third bottle she was able to sleep much better and could get up in the morning and eat a little breakfast, which showed a vast improvement for her. She continued the treatment, and to give the facts briefly, she is now as strong and well and free from pain as she was 20 years ago. She can eat meat, potatoes, milk or anything else she wants and they agree with her perfectly. She declares she feels 20 years younger, and her appearance certainly bears out the statement. From a skeptic I have been converted into a firm believer in Tanlac, and I want to be enrolled among those who are bringing this truly great medicine." Tanlac is sold in Tulsa by Quaker Drug Company, Puritan Drug Company and by the leading druggists in practically every city, town and village in America.—Adv.

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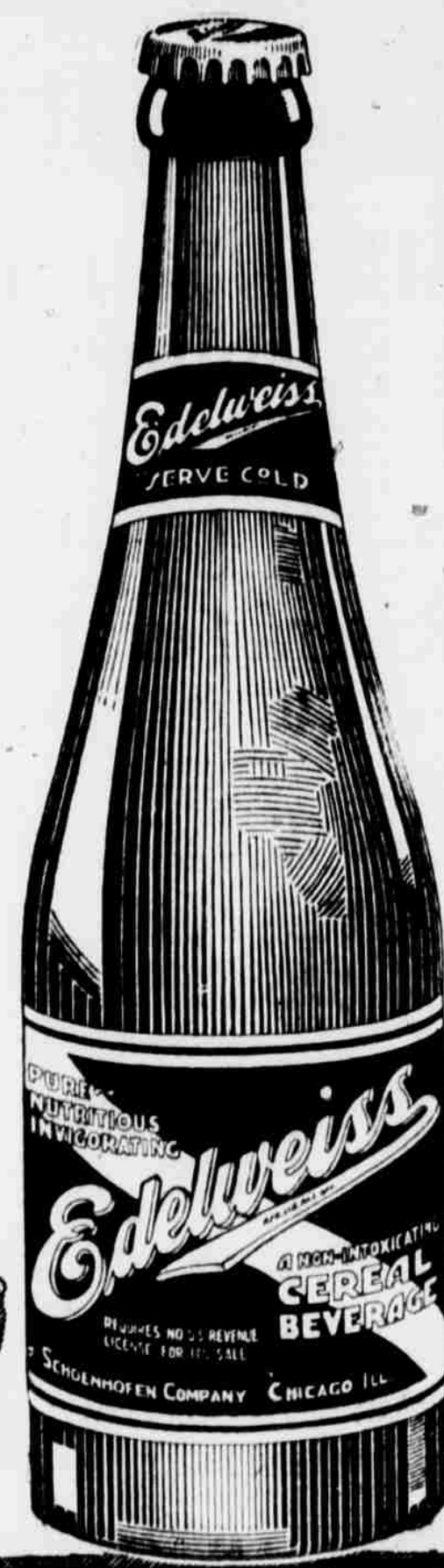
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